

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C.20231
 ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

| | |
|---|---|
| Date of mailing (day/month/year) 11 November 1999 (11.11.99) | |
| International application No. PCT/CA99/00293 | Applicant's or agent's file reference O8-869947WO |
| International filing date (day/month/year) 13 April 1999 (13.04.99) | Priority date (day/month/year) 13 April 1998 (13.04.98) |
| Applicant MIKI, Brian et al | |

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
24 September 1999 (24.09.99)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

| | |
|---|--|
| The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35 | Authorized officer S. Mafla Telephone No.: (41-22) 338.83.38 |
|---|--|

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

SECHLEY, Konrad, A.
Gowling Lafleur Henderson LLP
Suite 2600
160 Elgin Street
Ottawa, Ontario K1P 1C3
CANADA

| | |
|--|---|
| Date of mailing (day/month/year) 21 August 2000 (21.08.00) | IMPORTANT NOTIFICATION |
| Applicant's or agent's file reference 08-869947WO | |
| International application No. PCT/CA99/00293 | International filing date (day/month/year) 13 April 1999 (13.04.99) |

1. The following indications appeared on record concerning:

☐ the applicant ☐ the inventor ☒ the agent ☐ the common representative

| | | |
|---|--------------------------------------|---------------------------|
| Name and Address SECHLEY, Konrad, A. Gowling, Strathy & Henderson Suite 2600 160 Elgin Street Ottawa, Ontario K1P 1C3 Canada | State of Nationality | State of Residence |
| | Telephone No. 613 233 1781 | |
| | Facsimile No. 613 563 9869 | |
| | Teleprinter No. | |

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person ☐ the name ☒ the address ☐ the nationality ☐ the residence

| | | |
|--|--------------------------------------|---------------------------|
| Name and Address SECHLEY, Konrad, A. Gowling Lafleur Henderson LLP Suite 2600 160 Elgin Street Ottawa, Ontario K1P 1C3 Canada | State of Nationality | State of Residence |
| | Telephone No. 613 233 1781 | |
| | Facsimile No. 613 563 9869 | |
| | Teleprinter No. | |

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

| | |
|---|---|
| <input checked="" type="checkbox"/> the receiving Office | <input type="checkbox"/> the designated Offices concerned |
| <input type="checkbox"/> the International Searching Authority | <input checked="" type="checkbox"/> the elected Offices concerned |
| <input checked="" type="checkbox"/> the International Preliminary Examining Authority | <input type="checkbox"/> other: |

| | |
|--|--|
| The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35 | Authorized officer A. Karkachi Telephone No.: (41-22) 338.83.38 |
|--|--|

PATENT COOPERATION TREATY

PCT

09/673333

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| | | |
|--|---|--|
| Applicant's or agent's file reference 08-869947W0 | FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below. | |
| International application No. PCT/CA 99/ 00293 | International filing date (day/month/year) 13/04/1999 | (Earliest) Priority Date (day/month/year) 13/04/1998 |
| Applicant HER MAJESTY IN RIGHT OF CANADA as represented by T | | |

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 6 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☒ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.



None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA 99/00293

B x I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

B x II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 10,20,31 and 32 all completely, and 1,2,5,11,12,15, 21-30,37-40

Genomic DNA sequences differentially or preferentially expressed in seed coat tissues, seed coat promoters, vectors containing said promoters, plant cells and transgenic plants transformed with said promoters and vectors as represented in SEQ ID NO:7

2. Claims: 33 and 34 both completely, and 1,2,4,5,11,12,14,15, 16,18,21-30,37-40

Genomic DNA sequences differentially or preferentially expressed in seed coat tissues, seed coat promoters, vectors containing said promoters, plant cells and transgenic plants transformed with said promoters and vectors as represented in SEQ ID NO:8

3. Claims: 9,35 and 36 all completely, and 1,2,3,11,12,13, 21-30,37-40 all partially

Genomic DNA sequences differentially or preferentially expressed in seed coat tissues, seed coat promoters, vectors containing said promoters, plant cells and transgenic plants transformed with said promoters and vectors as represented in SEQ ID NO:9

4. Claims: 1,2,4,5,11,12,14,15,21-30 all partially

Genomic DNA sequences differentially or preferentially expressed in seed coat tissues, seed coat promoters, vectors containing said promoters, plant cells and transgenic plants transformed with said promoters and vectors as represented by sequences derived from SEQ ID NO:5

5. Claims: 6 and 16 both completely, and 1,11, 22-30 all partially

Genomic DNA sequences differentially or preferentially expressed in endothelium cells of the seed coat, endothelium promoters, vectors containing said promoters, plant cells and transgenic plants transformed with said promoters and vectors.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

6. Claims: 7 and 17 both completely, and 1,2,5,11,12,15, 22-30 all partially

Genomic DNA sequences differentially or preferentially expressed in hourglass and outer integument cells of the seed coat, hourglass/outer integument promoters, vectors containing said promoters, plant cells and transgenic plants transformed with said promoters and vectors, as represented by SEQ ID NO:2.

7. Claims: 8 and 18 both completely, and 1,11, 22-30 all partially

Genomic DNA sequences differentially or preferentially expressed in palisade cells of the seed coat, palisade promoters, vectors containing said promoters, plant cells and transgenic plants transformed with said promoters and vectors.

8. Claims: 1,11,22,23,24-30 all partially

Genomic DNA sequences differentially or preferentially expressed in the tobacco seed coat, tobacco seed coat promoters, vectors containing said promoters, plant cells and transgenic plants transformed with said promoters and vectors as represented by SEQ ID NO:1

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 99/00293

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C12N15/29 C12N15/82 C12N5/10 A01H5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C12N A01H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|-----------------------|
| X | CA 2 186 833 A (MINI OF AGRICULTURE AND AGRI F) 31 March 1998 (1998-03-31) the whole document --- | 1-30 |
| X | CA 2 211 018 A (CANADA MAJESTY IN RIGHT OF) 30 March 1998 (1998-03-30) the whole document --- | 1-30 |
| X | WO 97 15656 A (INDIANA CROP IMPROVEMENT ASS) 1 May 1997 (1997-05-01) the whole document --- | 1-30 |
| X | CA 2 149 000 A (FOBERT PIERRE ;MIKI BRIAN (CA); IYER VENKATRAM N (CA)) 10 November 1996 (1996-11-10) the whole document --- -/- | 1-30 |

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

Z document member of the same patent family

Date of the actual completion of the international search

14 October 1999

Date of mailing of the international search report

09.11.99

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

MADDOX, A

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 99/00293

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|-----------------------|
| X | <p>FOBERT P R ET AL: "T-DNA TAGGING OF A SEED COAT-SPECIFIC CRYPTIC PROMOTER IN TOBACCO"</p> <p>PLANT JOURNAL, vol. 6, no. 4, 1 January 1994 (1994-01-01), pages 567-577, XP002030412 ISSN: 0960-7412 the whole document</p> <p>---</p> | 1-30 |
| X | <p>WO 91 09957 A (DU PONT) 11 July 1991 (1991-07-11) page 83 -page 84</p> <p>---</p> | 1-23, 25-30 |
| X | <p>COLOMBO, L., ET AL.: "Downregulation of ovule-specific MADS box genes from petunia results in maternally controlled defects in seed development"</p> <p>THE PLANT CELL, vol. 9, no. 5, 1997, pages 703-715, XP002118567 the whole document</p> <p>---</p> | 1-23, 25-30 |
| A | <p>ODANI, S., ET AL.: "Soybean hydrophobic protein. Isolation, partial characterization and the complete primary structure"</p> <p>EUROPEAN JOURNAL OF BIOCHEMISTRY, vol. 162, no. 3, 1987, pages 485-491, XP002118845 cited in the application the whole document</p> <p>---</p> | 10,32,33 |
| A | <p>SABALA, I.: "Norway spruce mRNA for antifreeze-like protein (af70), complete cds."</p> <p>EMBL ACCESSION NO:D86598, 10 August 1996 (1996-08-10), XP002118846 the whole document</p> <p>---</p> | 1-40 |
| A | <p>RHODES, P.R., ET AL.: "Soybean seed lectin gene transposable element tgml"</p> <p>EMBL ACCESSION NO:K02837, 2 July 1996 (1996-07-02), XP002118847 the whole document</p> <p>-----</p> | 1-40 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA 99/00293

| Patent document cited in search report | | Publication date | Patent family member(s) | Publication date |
|---|---|---------------------|----------------------------|---------------------|
| CA 2186833 | A | 31-03-1998 | CA 2211018 A | 30-03-1998 |
| CA 2211018 | A | 30-03-1998 | CA 2186833 A | 31-03-1998 |
| WO 9715656 | A | 01-05-1997 | AU 7441996 A | 15-05-1997 |
| CA 2149000 | A | 10-11-1996 | US 5824863 A | 20-10-1998 |
| WO 9109957 | A | 11-07-1991 | AU 639059 B | 15-07-1993 |
| | | | AU 6974791 A | 24-07-1991 |
| | | | CA 2071943 A | 23-06-1991 |
| | | | DE 69033142 D | 08-07-1999 |
| | | | EP 0506763 A | 07-10-1992 |
| | | | IL 96768 A | 10-06-1997 |
| | | | US 5658772 A | 19-08-1997 |



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

| | | | |
|---|--|--|---|
| (51) International Patent Classification ⁶ : C12N 15/29, 15/82, 5/10, A01H 5/00 | | A3 | (11) International Publication Number: WO 99/53067 |
| | | | (43) International Publication Date: 21 October 1999 (21.10.99) |
| (21) International Application Number: PCT/CA99/00293 | | | |
| (22) International Filing Date: 13 April 1999 (13.04.99) | | | |
| (30) Priority Data: 09/059,090 13 April 1998 (13.04.98) US | | | |
| (63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Application US 09/059,090 (CIP) Filed on 13 April 1998 (13.04.98) | | | |
| (71) Applicant (for all designated States except US): HER MAJESTY IN RIGHT OF CANADA as represented by THE MINISTER OF AGRICULTURE AND AGRI-FOOD CANADA [CA/CA]; Eastern Cereal & Oilseed Research Centre, K.W. Neatby Building, Ottawa, Ontario K1A 0C6 (CA). | | | |
| (72) Inventors; and | | | |
| (75) Inventors/Applicants (for US only): MIKI, Brian [CA/CA]; 1876 Dorset Drive, Ottawa, Ontario K1H 5V1 (CA). GIZEN, Mark [CA/CA]; 848 Princess Avenue, London, Ontario N5W 3M4 (CA). MILLER, Shea [CA/CA]; 69 Kenilworth Street, Ottawa, Ontario K1Y 3Y5 (CA). BOW- | | | |
| | | MAN, Lu-Ann [CA/CA]; R.R. #3, Listowel, Ontario N4W 3G8 (CA). BATCHELOR, Anthea [GB/CA]; 45 Alexander Street, Ottawa, Ontario K1M 1N1 (CA). HU, Ming [CA/CA]; 279 Kundson Drive, Kanata, Ontario K2K 2N8 (CA). BOUTILIER, Kim [CA/NL]; Groen van Prinsterstraat 87, NL-6702 CP Wageningen (NL). | |
| | | (74) Agents: SECHLEY, Konrad, A. et al.; Gowling, Strathy & Henderson, Suite 2600, 160 Elgin Street, Ottawa, Ontario K1P 1C3 (CA). | |
| | | (81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). | |
| | | Published With a revised version of the international search report. | |
| | | (88) Date of publication of the international search report: 9 December 1999 (09.12.99) | |
| | | (88) Date of publication of the revised version of the international search report: 20 January 2000 (20.01.00) | |

(54) Title: SEED-COAT PROMOTERS, GENES AND GENE PRODUCTS

(57) Abstract

The present invention is directed to isolated genomic sequences that are differentially expressed within seed-coat tissues. These DNAs are expressed within the inner integument, thick, or thin, walled parenchyma, endothelium, palisade, hourglass, or stellate parenchyma cells of the seed-coat. Furthermore, this invention relates to promoter regions obtained from genomic sequences that are differentially expressed in seed-coat tissues, and their use for directing seed-coat specific expression of genes of interest within transformed plant cells or plants. Exemplified promoters include those obtained from the differential screening of a seed-coat library and cryptic promoters obtained using T-DNA tagging using a promoterless marker gene.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

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| DK | Denmark | LR | Liberia | SG | Singapore | | |
| EE | Estonia | | | | | | |

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 99/00293

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C12N15/29 C12N15/82 C12N5/10 A01H5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C12N A01H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|-----------------------|
| X | CA 2 186 833 A (MINI OF AGRICULTURE AND AGRI F) 31 March 1998 (1998-03-31) the whole document --- | 1-30 |
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| | --- -/-- | |

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

Z document member of the same patent family

Date of the actual completion of the international search

14 October 1999

Date of mailing of the international search report

09.11.99

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

MADDOX, A

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 99/00293

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|-----------------------|
| X | <p>FOBERT P R ET AL: "T-DNA TAGGING OF A SEED COAT-SPECIFIC CRYPTIC PROMOTER IN TOBACCO"</p> <p>PLANT JOURNAL, vol. 6, no. 4, 1 January 1994 (1994-01-01), pages 567-577, XP002030412 ISSN: 0960-7412 the whole document</p> | 1-30 |
| X | <p>WO 91 09957 A (DU PONT) 11 July 1991 (1991-07-11) page 83 -page 84</p> | 1-23, 25-30 |
| X | <p>COLOMBO, L., ET AL.: "Downregulation of ovule-specific MADS box genes from petunia results in maternally controlled defects in seed development"</p> <p>THE PLANT CELL, vol. 9, no. 5, 1997, pages 703-715, XP002118567 the whole document</p> | 1-23, 25-30 |
| A | <p>ODANI, S., ET AL.: "Soybean hydrophobic protein. Isolation, partial characterization and the complete primary structure"</p> <p>EUROPEAN JOURNAL OF BIOCHEMISTRY, vol. 162, no. 3, 1987, pages 485-491, XP002118845 cited in the application the whole document</p> | 10,32,33 |
| A | <p>SABALA, I.: "Norway spruce mRNA for antifreeze-like protein (af70), complete cds."</p> <p>EMBL ACCESSION NO:D86598, 10 August 1996 (1996-08-10), XP002118846 the whole document</p> | 1-40 |
| A | <p>RHODES, P.R., ET AL.: "Soybean seed lectin gene transposable element tgml"</p> <p>EMBL ACCESSION NO:K02837, 2 July 1996 (1996-07-02), XP002118847 the whole document</p> | 1-40 |

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA 99/00293

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 10,20,31 and 32 all completely, and 1,2,5,11,12,15, 21-30,37-40

Genomic DNA sequences differentially or preferentially expressed in seed coat tissues, seed coat promoters, vectors containing said promoters, plant cells and transgenic plants transformed with said promoters and vectors as represented in SEQ ID NO:7

2. Claims: 33 and 34 both completely, and 1,2,4,5,11,12,14,15, 16,18,21-30,37-40

Genomic DNA sequences differentially or preferentially expressed in seed coat tissues, seed coat promoters, vectors containing said promoters, plant cells and transgenic plants transformed with said promoters and vectors as represented in SEQ ID NO:8

3. Claims: 9,35 and 36 all completely, and 1,2,3,11,12,13, 21-30,37-40 all partially

Genomic DNA sequences differentially or preferentially expressed in seed coat tissues, seed coat promoters, vectors containing said promoters, plant cells and transgenic plants transformed with said promoters and vectors as represented in SEQ ID NO:9

4. Claims: 1,2,4,5,11,12,14,15,21-30 all partially

Genomic DNA sequences differentially or preferentially expressed in seed coat tissues, seed coat promoters, vectors containing said promoters, plant cells and transgenic plants transformed with said promoters and vectors as represented by sequences derived from SEQ ID NO:5

5. Claims: 6 and 16 both completely, and 1,11, 22-30 all partially

Genomic DNA sequences differentially or preferentially expressed in endothelium cells of the seed coat, endothelium promoters, vectors containing said promoters, plant cells and transgenic plants transformed with said promoters and vectors.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

6. Claims: 7 and 17 both completely, and 1,2,5,11,12,15,
22-30 all partially

Genomic DNA sequences differentially or preferentially expressed in hourglass and outer integument cells of the seed coat, hourglass/outer integument promoters, vectors containing said promoters, plant cells and transgenic plants transformed with said promoters and vectors, as represented by SEQ ID NO:2.

7. Claims: 8 and 18 both completely, and 1,11,
22-30 all partially

Genomic DNA sequences differentially or preferentially expressed in palisade cells of the seed coat, palisade promoters, vectors containing said promoters, plant cells and transgenic plants transformed with said promoters and vectors.

8. Claims: 1,11,22,23,24-30 all partially

Genomic DNA sequences differentially or preferentially expressed in the tobacco seed coat, tobacco seed coat promoters, vectors containing said promoters, plant cells and transgenic plants transformed with said promoters and vectors as represented by SEQ ID NO:1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA 99/00293

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---------------------|----------------------------|---------------------|
| CA 2186833 A | 31-03-1998 | CA 2211018 A | 30-03-1998 |
| CA 2211018 A | 30-03-1998 | CA 2186833 A | 31-03-1998 |
| WO 9715656 A | 01-05-1997 | AU 7441996 A | 15-05-1997 |
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| WO 9109957 A | 11-07-1991 | AU 639059 B | 15-07-1993 |
| | | AU 6974791 A | 24-07-1991 |
| | | CA 2071943 A | 23-06-1991 |
| | | DE 69033142 D | 08-07-1999 |
| | | EP 0506763 A | 07-10-1992 |
| | | IL 96768 A | 10-06-1997 |
| | | US 5658772 A | 19-08-1997 |

INTERNATIONAL SEARCH REPORT

International Application No

PC/CA 99/00293

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C12N15/29 C12N15/82 C12N5/10 A01H5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C12N A01H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|-----------------------|
| X | CA 2 186 833 A (MINI OF AGRICULTURE AND AGRI F) 31 March 1998 (1998-03-31) the whole document --- | 1-30 |
| X | CA 2 211 018 A (CANADA MAJESTY IN RIGHT OF) 30 March 1998 (1998-03-30) the whole document --- | 1-30 |
| X | WO 97 15656 A (INDIANA CROP IMPROVEMENT ASS) 1 May 1997 (1997-05-01) the whole document --- | 1-30 |
| X | CA 2 149 000 A (FOBERT PIERRE ;MIKI BRIAN (CA); IYER VENKATRAM N (CA)) 10 November 1996 (1996-11-10) the whole document --- -/-- | 1-30 |



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

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Date of the actual completion of the international search

14 October 1999

Date of mailing of the international search report

27/10/1999

Name and mailing address of the ISA

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Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.
Fax: (+31-70) 340-3016

Authorized officer

Maddox, A

INTERNATIONAL SEARCH REPORT

International Application No

PC/CA 99/00293

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|-----------------------|
| X | FOBERT P R ET AL: "T-DNA TAGGING OF A SEED COAT-SPECIFIC CRYPTIC PROMOTER IN TOBACCO" PLANT JOURNAL, vol. 6, no. 4, 1 January 1994 (1994-01-01), pages 567-577, XP002030412 ISSN: 0960-7412 the whole document --- | 1-30 |
| X | WO 91 09957 A (DU PONT) 11 July 1991 (1991-07-11) page 83 -page 84 --- | 1-23, 25-30 |
| X | COLOMBO, L., ET AL.: "Downregulation of ovule-specific MADS box genes from petunia results in maternally controlled defects in seed development" THE PLANT CELL, vol. 9, no. 5, 1997, pages 703-715, XP002118567 the whole document --- | 1-23, 25-30 |
| A | ODANI, S., ET AL.: "Soybean hydrophobic protein. Isolation, partial characterization and the complete primary structure" EUROPEAN JOURNAL OF BIOCHEMISTRY, vol. 162, no. 3, 1987, pages 485-491, XP002118845 cited in the application the whole document --- | 10, 32, 33 |
| A | SABALA, I.: "Norway spruce mRNA for antifreeze-like protein (af70), comploet cds." EMBL ACCESSION NO:D86598, 10 August 1996 (1996-08-10), XP002118846 the whole document --- | 1-40 |
| A | RHODES, P.R., ET AL.: "Soybean seed lectin gene transposable element tgml" EMBL ACCESSION NO:K02837, 2 July 1996 (1996-07-02), XP002118847 the whole document ----- | 1-40 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA 99/00293

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---------------------|----------------------------|---------------------|
| CA 2186833 A | 31-03-1998 | CA 2211018 A | 30-03-1998 |
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| WO 9715656 A | 01-05-1997 | AU 7441996 A | 15-05-1997 |
| CA 2149000 A | 10-11-1996 | US 5824863 A | 20-10-1998 |
| WO 9109957 A | 11-07-1991 | AU 639059 B | 15-07-1993 |
| | | AU 6974791 A | 24-07-1991 |
| | | CA 2071943 A | 23-06-1991 |
| | | DE 69033142 D | 08-07-1999 |
| | | EP 0506763 A | 07-10-1992 |
| | | IL 96768 A | 10-06-1997 |
| | | US 5658772 A | 19-08-1997 |

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PATENT COOPERATION TREATY

PCT

09 / 673333

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| | | |
|---|---|--|
| Applicant's or agent's file reference 08-869947W0 | FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below. | |
| International application No. PCT/CA 99/ 00293 | International filing date (day/month/year) 13/04/1999 | (Earliest) Priority Date (day/month/year) 13/04/1998 |

Applicant

HER MAJESTY IN RIGHT OF CANADA as represented by T

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 6 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☒ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☒ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☒ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☒ Unity of invention is lacking (see Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ Non of the figures.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CA 99/ 00293

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheets

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 99/00293

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C12N15/29 C12N15/82 C12N5/10 A01H5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C12N A01H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|-----------------------|
| X | CA 2 186 833 A (MINI OF AGRICULTURE AND AGRI F) 31 March 1998 (1998-03-31) the whole document | 1-30 |
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| | -/- | |



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

14 October 1999

Date of mailing of the international search report

27/10/1999

Name and mailing address of the ISA

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Fax: (+31-70) 340-3018

Authorized officer

Maddox, A

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 99/00293

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|-----------------------|
| X | FOBERT P R ET AL: "T-DNA TAGGING OF A SEED COAT-SPECIFIC CRYPTIC PROMOTER IN TOBACCO" PLANT JOURNAL, vol. 6, no. 4, 1 January 1994 (1994-01-01), pages 567-577, XP002030412 ISSN: 0960-7412 the whole document | 1-30 |
| X | WO 91 09957 A (DU PONT) 11 July 1991 (1991-07-11) page 83 -page 84 | 1-23, 25-30 |
| X | COLOMBO, L., ET AL.: "Downregulation of ovule-specific MADS box genes from petunia results in maternally controlled defects in seed development" THE PLANT CELL, vol. 9, no. 5, 1997, pages 703-715, XP002118567 the whole document | 1-23, 25-30 |
| A | ODANI, S., ET AL.: "Soybean hydrophobic protein. Isolation, partial characterization and the complete primary structure" EUROPEAN JOURNAL OF BIOCHEMISTRY, vol. 162, no. 3, 1987, pages 485-491, XP002118845 cited in the application the whole document | 10, 32, 33 |
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| A | RHODES, P.R., ET AL.: "Soybean seed lectin gene transposable element tgml" EMBL ACCESSION NO:K02837, 2 July 1996 (1996-07-02), XP002118847 the whole document | 1-40 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA 99/00293

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---------------------|----------------------------|---------------------|
| CA 2186833 A | 31-03-1998 | CA 2211018 A | 30-03-1998 |
| CA 2211018 A | 30-03-1998 | CA 2186833 A | 31-03-1998 |
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| | | AU 6974791 A | 24-07-1991 |
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| | | US 5658772 A | 19-08-1997 |